

CLAIMS

1. An electrophoretic display device, comprising:
 - a substrate,
 - 5 a partition wall disposed on a surface of the substrate,
 - a liquid layer, disposed in a container defined by the substrate and the partition wall, comprising electrophoretic particles and a dispersion medium,
 - 10 a first electrode formed at a position apart from the partition wall on the substrate,
 - a second electrode formed along the partition wall, and
- 15 means for applying a voltage between the first electrode and the second electrode,
 - wherein at the surface of the substrate defining the container, a resistance layer electrically connecting the first electrode and the second electrode is formed, and the electrophoretic particles in the container are moved between a surface of the partition wall and a surface of the resistance layer to effect display.
- 25 2. A device according to Claim 1, wherein the first electrode and the resistance layer are electrically connected at a position most distant from

the second electrode on the substrate.

3. A device according to Claim 1 or 2, wherein
the resistance layer is formed to cover the partition
5 wall.

4. A device according to any one of Claims 1 - 3,
wherein the resistance layer has a resistance value,
between the first and second electrodes, smaller than
10 a resistance value of the liquid layer between the
first and second electrodes.

5. A device according to Claim 1, wherein the
resistance layer is formed of a transparent material,
15 and a light reflection layer is disposed opposite to
the liquid layer through the resistance layer.

6. A device according to Claim 5, wherein between
the resistance layer and the light reflection layer, a
20 coloring layer formed of an insulating material is
disposed.

7. A device according to Claim 1, wherein the
first electrode is extendedly formed opposite to the
25 liquid layer through the resistance layer and an
insulating layer.

8. An electrophoretic display apparatus,
comprising:
 - a substrate,
 - a partition wall disposed on a surface of the
5 substrate,
 - a liquid layer, disposed in a container
defined by the substrate and the partition wall,
comprising electrophoretic particles and a dispersion
medium,
- 10 a first electrode formed at a position apart
from the partition wall on the substrate,
- 15 a second electrode formed along the partition
wall,
- a plurality of data lines disposed on the
substrate at a certain pitch,
- 20 a plurality of scanning lines and a plurality
of constant-voltage lines, the scanning lines and the
constant-voltage lines being disposed on the substrate
at a certain pitch while intersecting with the
plurality of data lines, and
- 25 a switching device and a capacitor which are
disposed at each of the intersections of the data
lines and the scanning lines, the capacitor holding a
voltage depending on display data by supplying a
sequential scanning signal to the scanning lines and
supplying a data signal to the data lines and
depending on the voltage held by the capacitor, a

voltage or a current being applied between the first and second electrodes so as to move the electrophoretic particles to effect display,

wherein at the surface of the substrate

- 5 defining the container, a resistance layer for electrically connecting the first electrode and the second electrode is formed, and the electrophoretic particles in the container are moved between a surface of the partition wall and a surface of the resistance
- 10 layer.

9. An apparatus according to Claim 8, wherein one of terminals of the capacitor is connected with the first electrode, and a time constant defined by a product of an electric resistance between the first and second electrodes and a capacitance of the capacitor is longer than a one-field period in sequential scanning of the scanning lines.

- 20 10. An apparatus according to Claim 8, the apparatus further comprises a drive voltage line, disposed at the surface of the substrate, electrically connected with the first electrode, and means for controlling a current flowing between terminals of the connected drive voltage line and the first electrode depending on the voltage held by the capacitor.

11. An apparatus according to Claim 10, wherein the apparatus further comprises means for compensating a fluctuation in current flowing between the terminals.

5 12. A driving method of an electrophoretic display apparatus of the type wherein the apparatus comprises:

a substrate; a partition wall disposed on a surface of the substrate; a liquid layer, disposed in 10 a container defined by the substrate and the partition wall, comprising electrophoretic particles and a dispersion medium; a first electrode formed at a position apart from the partition wall on the substrate; a second electrode formed along the 15 partition wall, and a resistance layer for electrically connecting the first electrode and the second electrode is formed at the surface of substrate defining container;

the driving method comprising:

20 applying a voltage of one polarity between the first and second electrodes to move the electrophoretic particles to a surface of the partition wall, and

25 applying a voltage of the other polarity between the first and second electrodes to move the electrophoretic particles to a surface of the resistance layer.

13. A method according to Claim 12, wherein after
the electrophoretic particles are moved on the surface
of the partition wall or the surface of the resistance
5 layer, a period during which the voltage between the
first and second electrodes is substantially zero is
provided.

14. A driving method of an electrophoretic
10 display apparatus of the type wherein the apparatus
comprises:

a substrate; a partition wall disposed on a
surface of the substrate; a liquid layer, disposed in
a container defined by the substrate and the partition
15 wall, comprising electrophoretic particles and a
dispersion medium; a first electrode formed at a
position apart from the partition wall on the
substrate; a second electrode formed along the
partition wall, and a resistance layer for
20 electrically connecting the first electrode and the
second electrode is formed at the surface of substrate
defining container; a plurality of data lines disposed
on the substrate at a certain pitch; a plurality of
scanning lines and a plurality of constant-voltage
25 lines, the scanning lines and the constant-voltage
lines being disposed on the substrate at a certain
pitch while intersecting with the plurality of data

lines; and a switching device and a capacitor which are disposed at each of the intersections of the data lines and the scanning lines, the capacitor holding a voltage depending on display data by supplying a

5 sequential scanning signal to the scanning lines and supplying a data signal to the data lines and depending on the voltage held by the capacitor, a voltage or a current being applied between the first and second electrodes so as to move the

10 electrophoretic particles to effect display;

the driving method comprising:

sequentially scanning the scanning lines to apply a voltage of one polarity between the first and second electrodes to move the electrophoretic

15 particles to a surface of the partition wall, and

sequentially scanning the scanning lines to apply a voltage of the other polarity between the first and second electrodes to move the electrophoretic particles to a surface of the

20 resistance layer.